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## Occurrence and behaviour of the Red-footed Booby at Ascension Island, 1962-64

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The Red-footed Booby *Sula sula* (Linn) is now very rare at Ascension Island (latitude 7° 57' South and longitude 14° 22' West in the Atlantic Ocean), although it probably once nested commonly on the main island until, like the majority of Ascension seabirds, its breeding colonies were extirpated during the nineteenth century mainly by introduced cats (Stonehouse, 1960, 1962). The species was last reported in large numbers in 1946 when Tomlinson (1947) found thousands roosting on inaccessible inland perches on the main island in the vicinity of Powers Peak, White Hill and Weatherpost (see maps in Stonehouse *op. cit.* and in Simmons 1967c for most of the localities mentioned in the present paper). In 1957-59, however, the members of the B.O.U. Centenary Expedition to Ascension failed to find any Red-footed Boobies on the mainland, the only known birds being about ten pairs living on Boatswainbird Island off the south-east coast (in view of Powers Peak, etc.). Only one of these pairs was known to attempt nesting (Dorward 1962a). Ashmole (1963) suggests that the birds seen by Tomlinson 'may have been the survivors from the original Ascension population, long prevented from breeding on the [main] island by the presence of cats' and possibly too old to breed in 1946; most of them would have reached the end of their life-span between 1946 and 1957 by which time they have been reduced to the tiny, mainly non-breeding remnant on Boatswainbird Island.

### SIGHTINGS OF RED-FOOTED BOOBIES IN 1962-64

I was resident on Ascension for two years in 1962-64 and made an intensive study of the Brown Booby *S. leucogaster* (Boddaert) at Stacks 1 and 2 off the north-west coast near the settlement at Georgetown (Simmons 1967b and c). During this time, I saw the Red-footed Booby on a few occasions and was also able to make some useful comparisons between the behaviour of this species and the Brown Booby. These observations seem worth placing on record as possibly the last on *S. sula* at Ascension before its imminent extinction there.

Sightings in 1962-64 were as follows:

- (1) brown phase individual with white tail soaring over the mainland near Powers Peak, 17th June, 1962;
- (2) white phase bird perched on ground near Powers Peak, collecting nest-material which it took in the direction of Boatswainbird Island, 23rd July, 1962;

(3) white phase individual on eight dates between 1st December, 1962 and 17th January, 1963, at Stacks 1 and 2 (see below);

(4) white phase bird on the wing at sea near Boatswainbird Island, 5th March, 1963, (no birds seen on the islet itself), and

(5) white phase bird flying up-coast across Clarence Bay (Georgetown) on the evening of 12th April, 1963.

There were no further sightings during the remaining ten months of my stay, or during a return trip to Ascension in April, 1966, (Simmons 1967a), but I did not again visit Boatswainbird Island or the south-east corner of the mainland.

### A RED-FOOTED VISITOR TO THE GEORGETOWN STACKS

I have called the first two of the five coastal stacks on the north-west of Ascension the "Georgetown Stacks" (Simmons 1967b) and these were visited on 645 days between 18th February, 1962 and 20th February, 1964—on every day between 19th April, 1962 and 19th April, 1963 and almost daily thereafter until I left Ascension. Brown Boobies were strictly resident at these colonies but the single Red-footed Booby was recorded only on the dates mentioned.

On the morning of 1st December, 1962, as I arrived on the mainland opposite Stack 2 for a routine watch, a white phase Red-foot flew up from the stack and passed up-coast. It was not seen again until 14th December when it was found preening at Stack 1; it left soon after, moving up-coast and landing on Stack 2. It was again watched briefly on Stack 1 on 16th December and in flight over the mainland near Stack 2 on the 17th. Then, for three consecutive days (27th-29th December), the bird was studied at close range at Stack 2 where it had taken up temporary residence near the site of a young adult male Brown Booby, showing social responses to this bird and other Brown Boobies. The Red-foot was last seen on 17th January, 1963 when it circled Stack 1, then Stack 2, before moving off up-coast. That this bird sought out the company of Brown Boobies and displayed to them indicates that it was unable to find a mate among the survivors of its own species at Ascension.

### APPEARANCE

The white phase Red-footed Booby was, of course, quite different in plumage-type from its predominantly dark congener—with mostly silky-white plumage except for a faint golden tinge on the head and lower back and black on the wings—though the brown phase of the species is much more similar to the Brown Booby. This particular individual was about the same size as the male Brown Booby (but with proportionately longer wings and tail and shorter tarsi) and may well have been a female as the male Red-foot is smaller than both males and females of the Brown Booby (see Simmons 1967b). At rest it looked much shorter in the neck than the Brown Booby but, when stretched to the full, its neck was actually longer. The neck feathers were long, almost lanceolate, giving it a "pleated" appearance when sleeked and a "rakish" one when relaxed—but in any case without the neat, plush, "natty" look of the shorter feathered Brown Booby. Like the other pantropical species, the Masked (or White) Booby



*S. dactylatra* Less., the Red-foot is flat across the base of the bill, lacking the characteristic raised "nasal bridge" of the Brown Booby, though otherwise rather similar in the shape of the bill to the latter. The Red-foot had most distinctive soft-part colours; the bill was a silvery blue-grey with the thin line of bare skin on the forehead salmon-pink; the skin round the large, dark eye was pale green; the sides of the lower mandible salmon-pink, bordered by a black line; the central gular area jet black, extending to a point within the interramal space; and the tarsi and toes a dark, deep red. The male Brown Booby in "nuptial colour" at Ascension has the bill a silvery pink and the feet, facial and gular skin bright chrome-yellow, with the skin round the eye bright blue, while the female has all these areas pale yellow throughout the year.

### MAINTENANCE BEHAVIOUR

The Red-footed Booby was not seen to dive for food. Its preening behaviour and comfort-movements (such as were seen) resembled those of the Brown Booby, including the double wing-beating, rolling and one wing-waving during bathing (Simmons in prep.). However, it used the wing-shake (or wing-ruffle) much more frequently in social situations than the Brown Booby (see below). It preened or rested when alone at its site but responded socially to Brown Boobies, and especially the male mentioned, when these were present and near.

### PERCHING AND MOVEMENT

At both stacks, the tree-adapted Red-foot perched on steep sites, such as rock tops, which usually permitted it a firm grip with its toes. At Stack 2, it settled regularly on rocks above and near the "hollow" (nest-site) of the young male Brown Booby—a rather deep and restricted recess in the top of a sloping boulder just large enough to take a single booby—entering this hollow in the absence of its usual owner. The Red-foot moved up and down from point to point mainly by either hopping, with the use of its wings to keep balance, or by flying out and landing back—but it was also seen occasionally to shuffle rather clumsily when only slightly changing its position. Its long tail sometimes trailed over the ground. After most hops or landings it performed a marked post-movement display (see below). In flight it resembled the Brown Booby much more than the Masked Booby (even though very similar to the latter in plumage-type)—flying low over the water like the former and not high up like the Masked, but its wing-beats were faster and less flexible than the Brown's and its wings more pointed and angled, with the primaries characteristically down-bent. The black trailing edge along the whole length of the wing, and a dark spot on the under surface near the wrist, were most distinctive in the otherwise wholly white bird. When pursued in flight by Brown Boobies, the Red-foot outdistanced them.

### POST-MOVEMENT DISPLAY

After a hop or flight from point to point, apparently always when responding socially to the Brown Boobies, the Red-foot usually landed in a most distinctive manner (though sometimes this behaviour was only

perfunctory). Uttering snorting, horse-like landing-calls ("gru . . ."), it flew in with neck arched and sleeked, bill pointing obliquely down, to alight and bow the bill still lower so that it was inverted and pointing back close to the toes in a brief but deliberate "curtsey-bow", following this with a recovery rear up of the head into an erect "frozen" posture before the bird relaxed. A similar curtsey-bow occurred after a hop and it seemed possible to me that such behaviour functioned to "indicate" the



*Photograph: J. B. Nelson*

Post-hop display of Red-footed Booby, Galapagos, 1964.

species-specific colour of the feet. The Brown Booby at Ascension has no special post-landing behaviour, though it gives landing-calls (Simmons 1967c). It does have a "post-hop" display (term from van Tets 1965) in social situations, formally lowering the head in a "bill-tuck" (Dorward 1962b, Simmons 1967c and in prep.).

### SALUTING

On the late morning of 27th December, the Red-footed Booby was alone within the hollow of the young male Brown Booby and, when the latter returned to a perch a few yards away and started preening, the Red-foot displayed to him. It continued to display to Brown Boobies intermittently at a variety of intensities for the next two hours from perches near the hollow, mainly to the young site-male but also occasionally to birds flying over. The display was one that is characteristic of boobies, especially in advertising situations, and usually called "sky-pointing" (Dorward, 1962b van Tets 1965, Nelson 1964, 1965, 1967) though Verner (1961) termed it the "four point" display in the Red-footed Booby and I prefer the name "saluting" (Simmons 1967c).

At full intensity, the Red-footed displayed thus:

(1) it stood with its body in a downward-oblique position and did an introductory sequence of forward and sideways bows ("pumping"), staring intently at the Brown Booby between bows;

(2) it then saluted *if the other bird looked at it* by slowly throwing back the head and stretching the neck until the bill was more or less vertical (sky-pointing), with the gular pattern exposed;

(3) at the same time it lowered the front end of the body still lower but raised its rear-end, especially the long tail, and "swanned" the wings (with the wrists lowered and elbows up, the folded primaries moving upwards and forwards over the back and opening slightly outwards),

(4) gave a loud, low-pitched, drawn-out, mooring "trumpet" or "bellow" and

(5) slowly relaxed afterwards.

The bird sometimes saluted twice in succession but usually there was an appreciable pause between salutes. At lower intensities, the display had only a partial throw-back of the head, little or no wing movement and no call—at times consisting merely of a slight head and tail raise (or even only the latter) after the initial series of bows and staring.

The full salute of the Brown Booby differs from the corresponding display of the Red-footed Booby in the following main respects:

(1) the bird stands in a more erect, upward-oblique position;

(2) it usually simply "stares" at the other bird before saluting, with only occasional bowing (if any);

(3) the "throw-back" of the head is much faster;

(4) there is no wing movement and little sway up of the tail;

(5) the call is an individual-specific whistling one;

(6) salutes may follow one another quickly;

(7) only the male salutes (whereas we know from the literature—*e.g.* Verner (1961)—that both sexes of the Red-foot will perform), and

(8) salutes are often given in flight (there is no record of this for the Red-foot).

## RITUALISED WING-SHAKING

The Red-footed Booby was noted to wing-shake frequently in social situations but, unfortunately, my notes go little further than stating that this was "a ritualised form of the normal comfort-movement" and do not make the precise situation clear. It is possible that the wing-shaking occurred either as a post-landing or pre-take-off behaviour, probably the latter. The Brown Booby has no ritualised wing-shaking though it sometimes does normal shaking before moving in social situations.

## AGGRESSIVE BEHAVIOUR

Only twice were the Red-foot and the male Brown Booby seen within close contact-range of each other and both encounters ended in aggressive behaviour. Once when the Brown Booby took nest-material into his hollow the Red-foot leaned down from above and pointed its bill towards him but then started vigorously bill-thrusting while "flicking" up both wings, partly



open, and quickly closing them on each forward thrust, grunting harshly. On another occasion, when the Brown Booby was in his hollow and threatened the Red-foot, the latter jabbed vigorously and pecked his bill without any wing movement.

### RESPONSE OF BROWN BOOBIES

In the main, the young male Brown Booby seemed somewhat apprehensive of the Red-foot and avoided it even when it was at the site, sometimes showing distant threat-behaviour—"ruffling", "hunching" and "bowing" (see Simmons 1967c). In the encounters mentioned above, he quickly retreated when attacked after bringing material to his site and, on the other occasion, faced up to the Red-foot, "ruffling", "hunching" and lunging incipiently towards it, provoking it to jab back. At Stack 1 and twice at Stack 2, female Brown Boobies "supplanted" it from the air when it had settled at their perches, while a number of birds chased it in flight near Stack 1.

### SUMMARY

The Red-footed Booby *Sula sula* is now very rare at Ascension Island and the few sightings in 1962-64 are recorded, involving both white and dark phase individuals. A single white phase bird, possibly a female, visited two colonies of Brown Boobies *S. leucogaster* for a few weeks and responded socially to that species, including the performance of advertising display. Some comparisons are made between the two species.

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